



Stone use and avoidance on Easter Island: Red scoria from the topknot quarry at Puna Pau and other sources

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ABSTRACT

The paper presents new observations on the use and avoidance of different red scoria rocks on Easter Island (Rapa Nui), made during fieldwork. It describes the different facies of the rock, their origins, their nature and their context of quarrying and use. From the latter, it is inferred that, for the prehistoric Rapanui, the meaning of red scoria transcended practical utility. A combination of stone context and ethnographic analogy suggests what this meaning or these meanings might be. Stone use on the Island is presented as a model against which the stone use of other prehistoric cultures might be measured.

Keywords: building stone, Easter Island, *moai*, Puna Pau, red scoria, topknot (*pukao*).

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INTRODUCTION

Recent fieldwork undertaken by the UCL/University of Manchester *Rapa Nui Landscapes of Construction Project* on the archaeological stone of Easter Island (Rapa Nui) has highlighted the central role played by stone there during prehistory and the sophisticated technical and social adaptations of the Islanders to it. Stone is found everywhere on the Island, and so too is the evidence for its procurement and utilisation. Among the many stones used was red scoria, a vesicular, often vividly coloured rock generated by explosive volcanic eruption. It stands out because of its colour and its conspicuous use at *ahu*, in particular for topknots or *pukao*, the bold red drums that crowned many of the *moai* raised on these. During the Island's prehistory and early history, however, different red scoriae were used for different things. Were these deliberate choices, and if so, why were they made, or is what we see merely a reflection of the different stones' properties and geological distribution?

There are possible functional answers to these questions. On the one hand, red scoriae have both a low specific gravity and are easy to work (remember, topknots were placed on the tops of *moai*); on the other, not all facies can be procured in sizes suitable for, for example, the largest topknots. For a full explanation of the interest shown in them, however, it is probably necessary to look beyond practical utility alone. One likely place is in the exclusive use of one facies of red scoria, from Maunga Puna Pau, for topknots, and its transport right across the Island. If this was not functionally determined, it indicates

that there was something special about Puna Pau scoria. Another is in the deposition of red scoria granules – where identifiable, usually from Puna Pau – in the bodies of *ahu* and the crematoria associated with these, and the later reuse of topknots and formless chunks of Puna Pau red scoria in inhumation burials. This both indicates a continuity of interest through time and suggests a possible reason for this – an association with death and funerary rites. Another can be glimpsed in the prehistoric use of other Island red scoriae. Compared to that from Puna Pau, these tended to be utilised at or close to source and their use overall less constrained. While similar in origin, and sometimes even appearance, to stone from Puna Pau, they were treated quite differently. Nonetheless, their recurrent use for so-called aberrant *moai* and, dressed, in particular positions in *ahu* indicates that they too were acknowledged as distinct from other Easter Island stones. Nor should we overlook the interpretative implications of the ethnographic record from Polynesia and the wider Pacific where this touches upon stone and how it was perceived in these regions. In Polynesia, for example, the colour red was widely associated with *mana* (see Firth 1967: 47; Handy 1971 [1927]: 123–6; Henry 1928: 384; Tregear 1891: 185 *passim*), while throughout the region particular places in the landscape were invested with transcendent meanings. There is also strong ethnographic evidence that much craft activity, including working with stone, was placed under ritualised constraint (Handy 1971 [1927]: 286–8; Henry 1928: 142–3; Linton 1923: 8, 164–5).

In this paper, I investigate these issues, first, by characterising and differentiating the different red scoriae

Table 1. The reported use of red scoria on Easter Island.

Site type	Puna Pau red scoria	Unspecified	Other red scoriae
<i>Ahu</i>	Topknots (common) Dressed blocks in front (common) Granules in core (common)	<i>Moai</i> pupils (rare)	Dressed blocks in rear (common) Formless lumps in core
<i>Ahu</i> crematoria	Granules (very common)		Granules (sparse–common)
Boathouses	Kerbstones (rare) Pavement (rare)		Kerbstones (sparse)
Inhumations	Topknots (sparse) Formless lumps (very common)		Granules (rare – one on Poike)
Garden features	Stone mulches (rare individual stones)		Stone mulches (very common) <i>Manavai</i> (rare)
Other	Aberrant <i>moai</i> (sparse) <i>Taheta</i> in topknots (rare) Rock art on topknots and <i>ahu</i> facia blocks (sparse) <i>Umu</i> (rare – Anakena only)	Aberrant <i>moai</i>	Aberrant <i>moai</i> (common)

used and, second, by contextualising these on site and across the Island. In particular, I consider the context of quarrying at Puna Pau, the stone's procurement, and its use for topknots, as a building material and in aberrant *moai* (Table 1).

I acknowledge that the Island's red scoria is not uncharted territory. Much previous work has touched upon it, not least that of the Katherine and Scoresby Routledge team (Routledge 1919: 199) and that of Jo-Anne Van Tilburg, whose 1986 survey provides a useful introduction to it (see also Baker 1998: 282–3; Cauwe 2011; Gioncada *et al.* 2010: 863–4; Heyerdahl & Ferdon 1961: 134, 372–4, 464–5, 468; Metraux 1971 [1940]: 300–3; Seelenfreund & Holdaway 2000; Shepardson *et al.* 2004; Van Tilburg 1994: 140–2; Vargas *et al.* 2006: 162–67, 176–81 *passim*). But this is the first paper to be written since the commencement of excavations at Puna Pau by the *Rapa Nui Landscapes of Construction Project* and, most importantly, the first approached from a landscape perspective.

In deference to Van Tilburg's paper, I avoid detailed discussion of colour *per se* and the pan-Polynesian perceptions of it upon which she grounds her interpretation (1986: 24), although it must be emphasised that these remain valid and relevant. My interest, rather, is in a conspicuous red rock, part of a wider geologically and culturally interrelated set, the quarrying and use of which linked and re-linked the Rapanui both across the Island and through its prehistory and early history. Because the Island's prehistory is recent and relatively undisturbed, and because of the inherent geological variability of the volcanic landscape, the material record, including the associations and patterns upon which the interpretation of stone relies, is abundant and good, and its study both clarifies our understanding of the way in which stone was used and perceived there and provides a useful yardstick against which the residues of analogous prehistoric stone using cultures can be measured.

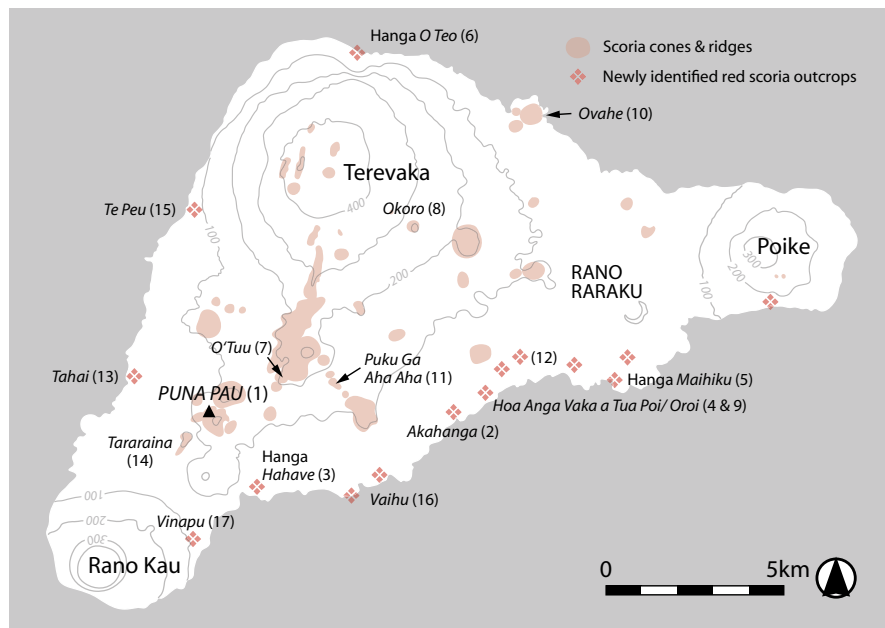
THE NATURE AND ORIGIN OF RED SCORIA

Born out of the heat and pressure at the heart of a volcano, all volcanic rocks are dramatic. And so it is with the Island's red scoriae. Like its more abundant flow lavas, all are basaltic (that is, they contain relatively little silica), but the way in which they were ejected and cooled has resulted in a mineralogy, morphology, colour and distribution that is quite distinct. Rather than flowing away, they were spat out, expanding and contorting violently before settling, their exposure to air colouring them red. Generically, they range from loose cinder to welded (as opposed to cemented) spatter or agglutinate, the different facies a result of the different degrees of expansion, contortion, oxidation and cooling to which they were subjected before settling. Mostly, they are found on or near the crater or vent from which they were ejected. Volcanism is a dynamic process, however, and red scoriae, like other rocks, are often swept up in this. Thus they are occasionally found in Island lava flows, perhaps ejected into and carried along with these, and as inclusions in Rano Raraku tuff. They also occur sandwiched between or sandwiching rock of quite different type, and themselves frequently picked up rocks of other types.

Worked exposures

Red scoriae occur all over the Island (Figure 1). Many are weakly welded and as such unworkable, but we now know of definite or probable extraction/working of welded scoriae in at least ten places and can infer it for many more. These include upstanding craters or vents, comprising welded cinder; upstanding ridges, comprising both welded cinder and scoriaceous spatter; locally craggy flat or undulating landscapes, comprising scoriaceous spatter (the topography in these latter locations is controlled by the basic to intermediate flow lavas with which red scoria is characteristically associated); and a scree below a crater, comprising welded cinder (Table S1).

Figure 1. The natural distribution of red scoria on the Island. The asterisks represent a tiny proportion only of the likely total (scoria cones and ridges after Vezzoli & Acocella 2009).



Not all certainly yielded stone in sizes suitable for the largest topknot, but some could have, and many demonstrably did yield stone big enough for smaller topknots, the larger dressed building stones used in *ahu* and aberrant *moai*. It is reasonable, therefore, to consider them as potential sources for these things. Owing to the particular circumstances of their eruption, the stones extracted from these sites are easily distinguishable to the naked eye. Their principal distinguishing characteristics are the size and shape of the fragments comprising them, their welding, and how homogeneous or well sorted they are. Colour may also be important.¹ It is important to acknowledge, however, that the inherent inhomogeneity of many red scoriae renders standard geological description problematic, and that in practice the only way to distinguish them with confidence is through direct visual comparison (Figure 2).

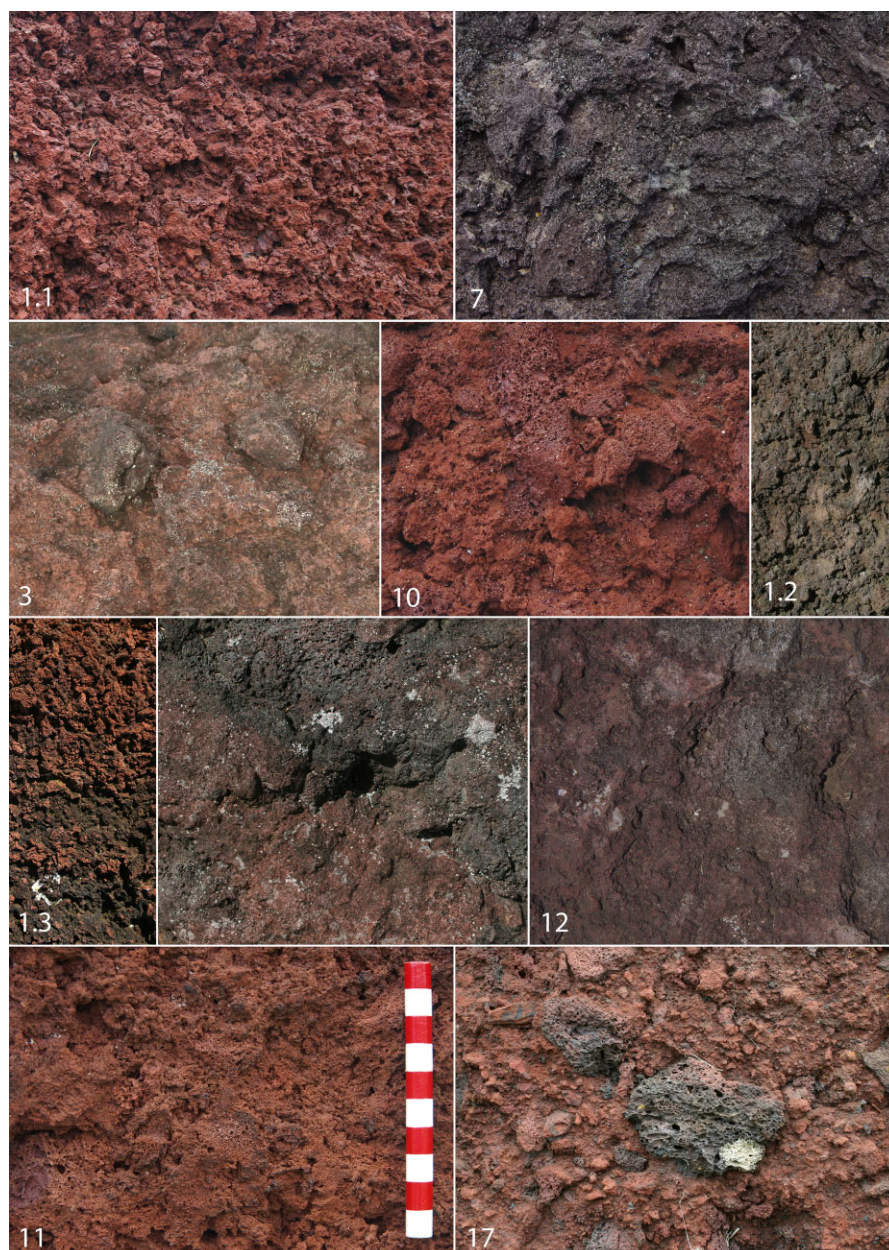
Puna Pau

Best known and among the most easily distinguishable is that from Puna Pau (Figure 3). Puna Pau is a cinder cone and the stone quarried from it is best described as welded cinder. It is characterised by a fine even texture of angular, mostly small pebble-sized (5–15 mm) scoriaceous fragments, strong welding, a vivid red colour and (in the excavated quarry and most surviving topknots) a relative lack of inclusions of other stone (Figure 2: 1). It was quarried from the base of the visible crater, from which it dips away, and where extensive workings inferred from the many topknots still scattered around the Island lie buried by tailings and weakly welded, often coarser-textured red scoria weathered from above. Though naturally red, scoria from Puna Pau ranges from red,

through a purplish red similar to that of some of the Island's other scoriae, to grey. The darker colours are attributable to surface leaching, which leaves behind a black rind, and fire, which reduces or soot-soaks it (Figure 2: 1.2 & 1.3).

Maunga Te Puha Roa (Ovahe) and Puku Ga Aha Aha Two other sites have also been claimed as sources of topknots: the sea cliff above Ovahe beach, because of anecdotal reports that topknots re-erected on nearby *Ahu Nau Nau* were fashioned from stone obtained from a cave-like excavation there, and Puku Ga Aha Aha, because modern quarrying for road stone yielded abundant stone-working tools (L. Gonzales N. pers. comm.). Stone from both sites would have been extractable in sizes suitable for large topknots, but at neither has it the even texture of that from Puna Pau and characteristic of topknots (including those at *Ahu Nau Nau*). Thus while there is evidence that both were worked, we can probably rule out any association between them and topknots. Maunga Te Puha Roa, the hill out of which Ovahe sea cliff was cut, is a cinder cone and the stone from it is best described as welded cinder. It is characterised by an uneven texture of small to medium pebble-sized (between 5 and 50 mm) scoriaceous fragments, strong welding and a patchy, vivid red (Figure 2: 10) and purple colour. Puku Ga Aha Aha marks the end of a spatter ridge and the stone from it is best described as homogeneous to inhomogeneous scoriaceous spatter. It is characterised by a very uneven texture of contorted scoria fragments, strong welding and a vivid red colour (Figure 2: 11). It incorporates patchy (rare to moderate), flattened, grey scoria inclusions up to 200 mm across.

Figure 2. Different red scoriae worked and quarried on the Island. From left to right and top to bottom: 1.1, Puna Pau; 7, O'Tuu; 3, Moai A Umu; 10, Ovahe beach; 1.2, burnt Puna Pau; 1.3, Puna Pau with black weathering rind; unnumbered image, near Pui; 12, north of Runga Va'e; 11, Puku Ga Aha Aha; 17, Vinapu. The site numbers are those shown on Figure 1 and listed in Table S1.



Maunga Okoro

The only other utilised source of red scoria with any resemblance to that from Puna Pau known to me is Maunga Okoro, close to the middle of the Island. Okoro is another cinder cone. At its foot are scattered parts of four to six red scoria *moai*. It is postulated that these statues are not in their original location (Van Tilburg 1986) but the stone from which they are fashioned resembles that comprising Okoro, and most probably derives from it. It is characterised by a fine even texture of subrounded, mostly small pebble-sized (5–10 mm) scoriaceous fragments, moderate welding (of *in situ* exposures) and a vivid red

colour. A very powdery fracture perhaps indicates the presence of more than usually abundant weathered crystal inclusions. The position of the *moai*, large stones at the base of a slope consisting of smaller ones, suggests the possibility that they are in fact part of a natural scree, and as at the main *moai* quarry of Rano Raraku were set up at the foot of the hill that yielded them.

Maunga O'Tuu, north of Runga Va'e and Hanga O Teo
The other utilised red scoria outcrops known to me consist primarily of scoriaceous spatter (Table S1). This ranges from homogeneous, which is uncommon, to very

Figure 3. The topknot quarry. Clockwise from top left: a Processional Way(?); tool marks inside the crater; the Routledge team's 1914–1915 map of the quarry (topknots 24–31 have disappeared); hammerstone and stone debitage from the dressing and re-dressing of tools; an obsidian adze (not a stone-working tool) found upright in colluvium adjacent to one of the topknots outside the crater (photo: A. Stanford); and an adze used in red scoria extraction. Routledge map © Trustees of the British Museum.



inhomogeneous, which is common. (Owing to the way in which it is formed, spatter is never very homogeneous.) At the homogeneous end of the range is Maunga O'Tuu, where there are two unextracted *moai*. Stone from O'Tuu is characterised by a very uneven texture of contorted scoria fragments, strong welding and a violet colour. Its colour and lack of inclusions distinguish it from the vivid red scoria at nearby Puku Ga Aha Aha (Figure 2: 7) but otherwise it is very similar. Homogeneous scoriaceous spatter was also worked on the slopes north of *Ahu Runga*

Va'e and at Hanga O Teo on the north coast. The former is characterised by a very uneven texture of contorted scoria fragments, strong welding and a dark red colour (Figure 2: 12). Its quarrying is indicated by a series of unnaturally angular cuts in the outcrop. The latter is characterised by a very uneven texture of contorted scoria fragments, strong welding, and variable colour, which consists of bands of dark red and violet. The outcrop is in a sea cliff to one side of a small bay. Quarrying here is indicated by the presence nearby of an aberrant *moai* in an identical stone

(Figure 8: bottom right) and by a shallow, but clearly defined, rectangular bay cut artificially into the cliff.

Vinapu and Moai A Umu

At the inhomogeneous end of the range are Ahu Vinapu and Moai A Umu. This type, which was wrongly conflated by Van Tilburg (1986) with that from O'Tuu, tends to have a finer background texture but unlike it, incorporates abundant large inclusions or swirls of vesicular grey scoria. At Vinapu and Moai A Umu, it is characterised by a very fine background texture, strong welding and a pale red, almost pink colour. At Vinapu it incorporates moderate to common swirls of grey scoria, and at Moai A Umu common subrounded to subangular grey scoria swirls and nodules up to 400 mm across (Figure 2: 3). These are easily distinguishable from local welded cinder, which was also utilised at Vinapu (Figure 2: 17). The quarrying of local red scoria at Vinapu is demonstrated by the presence of three vertically cut bays, approximately 300 m upslope of the *ahu*, about one of which, at the time of our visit, lay fragments of stone-working tools. There are also several demonstrably utilised outcrops in the vicinity of *Ahu Hanga Hahave*.

This is only a sample of the red scoriae worked on the Island during its prehistory. To my certain knowledge, there are good local matches for stone used in building at nine other locations around the Island (Tables S2–4) and without doubt there are *or were* other utilised red scoria outcrops that I have not identified. Two hills – Puku Ga Aha Aha, to which I referred above, and Maunga Tararaina on the outskirts of Hanga Roa – have been heavily quarried in recent years and prehistoric exposures perhaps lost; others perhaps lie on land inaccessible to us because it is private (O'Tuu has not long been returned from Chilean government to Rapanui ownership) or contested; and others still are implied by the presence in the landscape and in some structures of undressed, presumably locally garnered, boulders. I am not in a position, therefore, to assert any universal geological or archaeological rules regarding the nature of red scoria exposures and their utilisation. It is surely significant, however, that different scoriae have different topographical associations; and that these scoriae, apparently, were sourced and used in quite different ways.

QUARRYING AT PUNA PAU

In a small hollow, on the highest part of the Island they met with several such cylinders as are placed on the heads of the statues. Some of these appeared larger than any they had seen before . . . Mr Wales, from whom I had this information, is of the opinion that there had been a quarry here, whence these stones had formerly been dug; and that it would have been no difficult matter to role them down the hill after they were formed.

James Cook (2007 [1777]: 176)

For most archaeologists, the first question that arises in relation to Puna Pau is not why so many topknots have disappeared, but why they were left there in the first place (Figure 3). The available evidence is ambiguous but there are three main alternative interpretative explanations. The first is that they represent ongoing quarrying activity, which was abandoned unfinished due to some sort of catastrophic economic or social development – until recently the favoured explanation for the end of Easter Island's statue period (e.g. Diamond 2006). The second is that they formed a Processional Way: that is, they were deliberately positioned to line the route into and out of the quarry, just as *moai* from the main statue quarry at Rano Raraku appear to have been deliberately placed along different routes into and out of it. The third is that they comprise primary rubbish, material spoiled during production or transport out of the quarry and abandoned *in situ*, either for functional reasons or, perhaps more likely in view the effort invested in them, in a local equivalent of the Inca *piedras cansadas* or tired stones, which it was believed bad luck to move further. A Processional Way might of course utilise spoiled stone, so that the second and third of these possible explanations need not be mutually exclusive.

The evidence of a possible role for catastrophic societal collapse in the survival of topknots at Puna Pau lies in an analogy with the main *moai* quarry at Rano Raraku, where the varying states of completion of the many unextracted and untransported *moai* at the site has led some to believe that quarrying stopped suddenly (e.g. Skjölsvold 1961: 366), and the aforementioned alignments into and out of the quarry, which were originally thought to comprise *moai* abandoned in transit to their intended *ahu* (Routledge 1919: 193–5; Skjölsvold 1961: 378–9). For the statue quarry itself, the force of this view is weakened by evidence that some of the *moai* there were abandoned deliberately, because they were found wanting and/or because they were never intended to be moved (Cauwe 2011: 25–33; Hamilton *et al.* 2011: 178–9; Routledge 1919: 181–2; Skjölsvold 1961: 365); and for the “transit” *moai*, by weathering profiles on the downward sides of many, which show that they were formerly standing, and evidence at their bases for possible foundations (Hamilton 2013: 104 & fig. 8; Heyerdahl *et al.* 1989: 56).

Having observed nothing new, which would suggest a role for catastrophic societal collapse in the survival of topknots at Puna Pau (neither unextracted topknots² nor varying states of completion), the first alternative is not elaborated on here. There is however good, if ambiguous, evidence for the second and third.

On the ground today, the surviving topknots look higgledy-piggledy but they more or less line the way out of the quarry. A few lie in the crater, two in an artificial hollow on the lip, which might be part of an early route out that was remodelled later in the quarry's operational life, while another dozen or so are strung out in a rough line on the slope outside. Their distribution as mapped by the Routledge team comprises several deliberate-looking

but possibly random clusters (Figure 3: centre right). One topknot in the crater is propped up next to a compact, possible roadway (Downes *et al.* 2013: 21; Hamilton 2013: 101); and the angle of rest of several on the outside suggests that they too might be propped (Figure 3: top left). Two partial – or deeply buried – topknots, also on the outside, lie in a distinct hollow-way leading to a notch in the lip of the crater, and just downslope of this, hard by another compact roadway, another lies in a shallow, ramp-like cut. Excavation here encountered a rare obsidian adze, clearly not a stone-working tool, blade-down in red scoriaceous colluvium immediately in front of the topknot (Figure 3: bottom left) (Downes *et al.* 2012: 20–4; Hamilton 2013: 100).

All this seems “deliberate”, but with the exception of the obsidian adze it can be explained equally well in terms of the practical necessities involved in the operation of a quarry, a Processional Way (that is, deliberate placement) or some form of ritual abandonment. Many Puna Pau topknots have been damaged and it is possible that they were abandoned for this reason, perhaps pushed off the road close to where the damage occurred. And yet, as Mr Wales observed, some are larger than those present at *ahu* and could doubtless have been worked down to a useful size, even though damaged. This apparently irrational waste of labour and stone shifts the weight of interpretative evidence from the functional to the non-functional explanations. But which? The idea of a Processional Way finds strong support in *moai* alignments, which lead into/out of the main *moai* quarry at Rano Raraku, that of structured or ritual abandonment, analogous to the Inca *pedras cansadas*, in a belief held in Polynesia and more widely across the Pacific, that stone was somehow animate (Handy 1971 [1927]: 25–6; Jones & White 1988: 61–2; Kahn 1990; Linton 1923: 165; Malinowski 1961 [1922]: 235; Petrequin & Petrequin 1993: 226) – individual and pairs of eyes stare out of the living rock of both Puna Pau and Rano Raraku quarries (Hamilton 2013: fig. 5) – and in the observation that in some parts of Polynesia technical or ritual errors could lead to the abandonment of an industrial project (Handy 1971 [1927]: 286–7).

PROCUREMENT STRATEGIES AND USE

Puna Pau quarry was exploited massively, with a minimum of 500 cubic metres removed (based on a conservative estimate of 4.5 cubic metres per topknot) and exported around the Island. By contrast many Island stones, including other red scoriae, were exploited locally and on a completely *ad hoc* basis (cf. Figures 4, 6 & 7). The existence of such diametrically opposed stone procurement strategies says a lot about the prehistoric Islanders’ knowledge of, and access to, stone; and about the value they placed upon it. When they chose one variety of stone over another, that choice was deliberate. When they chose not to use a particular stone, that too was deliberate. Up to a point this will have been a function of practical utility,

since in all stone working, be it sculpture or building, there is a conflict between ease of working, stone size and distance travelled (essentially availability). But on Easter Island the best stone, considered in these terms, was not always used and it is clear that there was much more to its choice than this. By looking at which stones were used where, and which were not, we can begin to get an idea of what this means.

“Where did you get that hat?”

We have counted nearly a hundred whole or partial topknots around the Island, to which we can add at least 13 that have disappeared since 1914–15, when the Routledge team mapped Puna Pau quarry. In addition to nine shown on their map, which have since disappeared, P. Sebastián Englert mentioned one at Vinapu (cited in Heyerdahl & Ferdon 1961: 110); and Helene Martinsson-Wallin unknown quantities at *Ahu* Tautira and the lost *Ahu* Riki Riki, which was located at the far end of Rano Kau (Martinsson-Wallin 1994: app. 1; Thompson 1891: 513). Except on Poike, they are or were associated with *ahu* all around the Island’s coast. They are absent from the main statue quarry at Rano Raraku, however, and most of the Island’s interior, including its three principal volcanoes – Poike, Rano Kau and Terevaka (Figure 4). Nor are they associated with *moai* on the aforementioned *moai* alignments or *moai* in stone other than Rano Raraku tuff. On the other hand, where I have been able to approach close enough to identify it, the stone comprising unambiguous whole or partial topknots is in every case from Puna Pau.

Not every *moai* fashioned from Rano Raraku tuff and mounted on an *ahu* was certainly crowned with a topknot made from Puna Pau red scoria, but there was a recurrent and probably exclusive, *tapu*-like association between topknots and *ahu* that was almost Island-wide. There is no doubt, therefore, that there was something very special about “that hat” and the stone from which it was fashioned.

When it comes to the meaning of this and why topknots occur in some places and not in others, the literature is surprisingly quiet. Van Tilburg sweeps them up in her all-embracing theory of colour, postulating connections between them and particular lineages and a range of possible stages through which these or members of these went – war, birth and aggrandisement (Van Tilburg 1986, 1994: 140–2). Otherwise, the only published explanations known to me are those of Alfred Metraux (1971 [1940]) and William Rivers (1920). Rivers drew a parallel between them and a Marquesan practice in which, as a sign of mourning, stones were placed on the heads of images representing the dead. Metraux dismissed this view because the practice was apparently unknown to his principal authorities on the Marquesas. In view of the exclusive use of Puna Pau red scoria in topknot manufacture, however, and the particular association of these with *ahu*, a monument type known to be connected with the disposal of the dead (an observation made by

Figure 4. The distribution of topknots (*pukao*) on the Island. All of them are from Puna Pau.

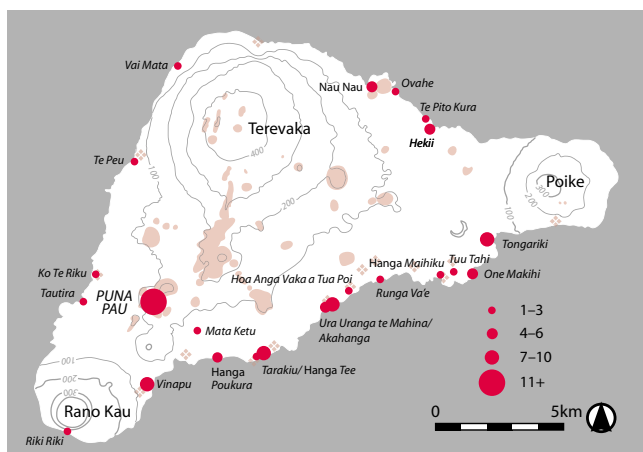
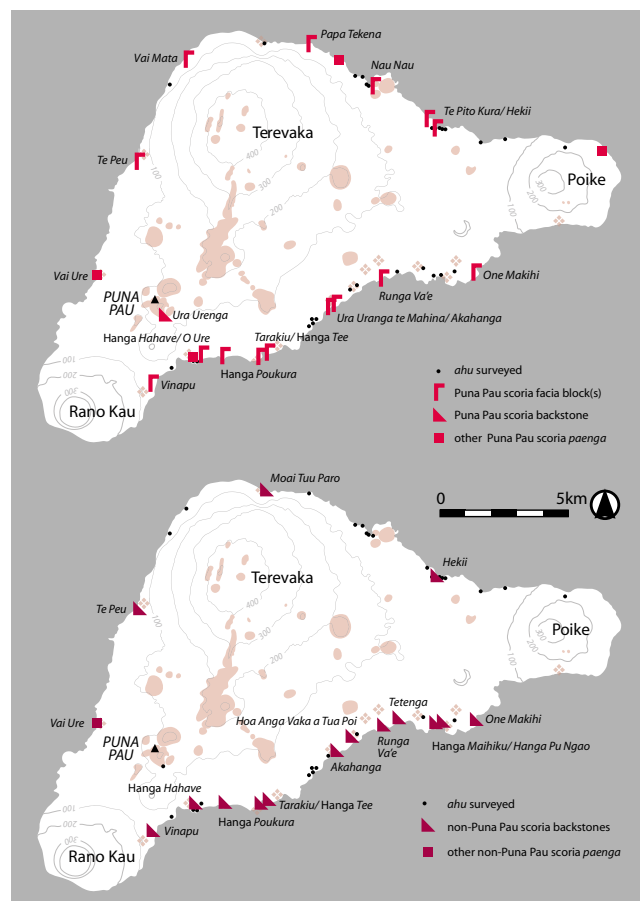


Figure 5. The use of red scoria in building was restricted. Clockwise from top left: Puna Pau red scoria facia blocks at *Ahu* Akahanga and Papa Tekena; local red scoria kerbstones in a house at *Ahu* Hoa Anga Vaka a Tua Poi (note their peripheral position); reused Puna Pau red scoria kerbstones in the pavement of a house and revetting the pavement of a house (near and at *Ahu* Te Peu, respectively); local red scoria in the rear wall of *Ahu* Te Peu (next to the scale); and local red scoria in the rear wall of *Ahu* Vinapu I.



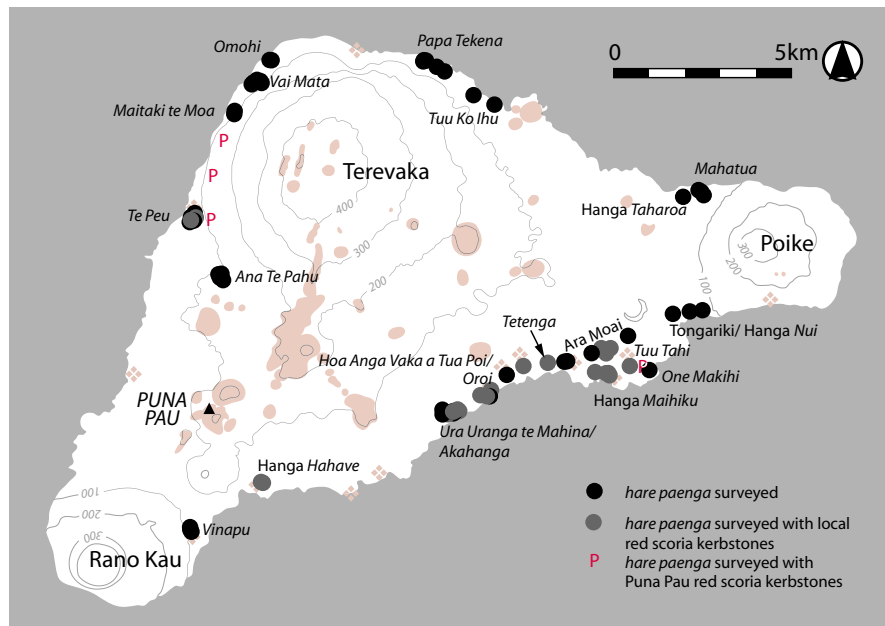
Figure 6. Red scoria used in the construction of *ahu*. Top, dressed blocks from Puna Pau (the block identified on Poike is unassociated, but there are suggestions that there was a structure nearby); bottom, dressed and fitted red scoria from other, mostly local sources. I have so far failed to identify scoria outcrops in the vicinity of *Ahu* Hanga Poukura and Hekii.



Rivers), his alternative theory that topknots were merely “an attempt to embellish the [*moai*] and to add an amusing naturalistic touch” (Metraux 1971 [1940]: 301–2) is hardly satisfactory.

Those sites, such as *Ahu* Akivi, from which topknots are absent, suggest a second set of alternatives. First, absence could be explained by robbing. Akivi, for example, may not now have topknots, but there was an otherwise unexplained and fairly superficial deposit of red scoria in a pit in front of the *ahu* (Mulloy & Figueroa 1978: 24 & fig. 9), analogous to those I have noted in front of *ahu* elsewhere, while nearby Ana te Pahu, a cave with a number of probable later burials, contains numerous cobble-sized fragments of Puna Pau red scoria, possibly sourced from a nearby *ahu*. On the other hand, although there is no actual evidence for it, we cannot rule out the possibility that Puna Pau red scoria was simply not available to some *ahu* builders, not affordable or even not appropriate. Once again, it is possible that there is truth in all of these ideas. The contrast between the colour of

Figure 7. Boat-shaped houses (*hare paenga*) with red scoria kerbstones. Except for a few kerbstones fashioned from Puna Pau scoria, which was perhaps derived from *ahu*, there is a direct correspondence between the utilisation of red scoria in boat-shaped houses and its natural distribution.



topknots and *moai* (which are ochre or green grey) and topknots and the sea, against which most would have been viewed, is striking and might well have been used decoratively.³ On the other hand, the conclusion that Puna Pau scoria was not just a stone is inescapable. We cannot think about it without also thinking about Puna Pau as a source. We cannot think about it without thinking about the wider meaning of colour in Polynesia. And we cannot think about it without considering where and, above all, how it was used.

Building with red scoria

Though light and easy to work, as a building material Puna Pau red scoria tended to be restricted to the fronts of *ahu*, where it comprises the upper course of the main platform (Figures 5 (top) & 6 (top); Table S2), and their cores and ramps, in which it occurs crushed. (I have identified it used structurally in the rear wall only of the reconstructed Ahu Ura Urenga.) The examination of over 70 boat-shaped houses or *hare paenga* threw up only five in which it was present (Figures 5 (bottom) & 7; Table S3), none of the highest quality, and in at least two cases reuses rather than primary uses; this despite the recurrent use in boat-shaped houses of non-local flow lavas. It is rare, too, in humbler structures. By contrast, other red scoriae hardly ever occur in the fronts of *ahu* but, where available locally, are often found in the rear, usually as large dressed blocks (out of 44 examined by us around the Island, 15 out of 16 such identifications were within 1 km of a known geological source, and most much closer – Figures 5 (middle left) & 6 (bottom); Table S2).

They are also five times as common in the kerbs of boat-shaped houses as Puna Pau red scoria, albeit in small quantities and usually away from the centre, where the best stones are found (Figures 5 (middle right) & 7; Table S3). Where available locally, other red scoriae are also widely incorporated into stone mulches and other garden features.

Our interest here, however, is as much in what red scoria was not, as what it was used for. Why eschew such a useful, distinct stone? Several possibly overlapping explanations come to mind. Red scoria was perhaps too precious. A *tapu* surrounded it or the role for which stone was required, which precluded its use (an association, say, with death, status or a particular deity). We see exactly this on Hivaoa in the Marquesas, where stone (also mostly red scoria) from the quarry of Teohopuapu was strictly reserved for *tiki* and *ma'ae*, stone for secular structures being acquired elsewhere (Linton 1923: 163). Or perhaps an alternative stone was perceived to be in some way more appropriate: just as red scoriae reoccur in particular places, so do beach boulders, dressed flow lavas and other stones (Hamilton *et al.* 2011). The foregoing observations – the other side of the coin, as it were, to the preferences shown in its use for topknots and *moai* – help us choose between these possible explanations. Most red scoria quarried at Puna Pau ended up on or near an *ahu*, be it as a topknot or a building stone, so clearly the association between Puna Pau red scoria and *ahu* is a real one. At the same time, there is dissociation between it and boat-shaped houses. Indeed, beyond *ahu*, both Puna Pau and other red scoriae appear either to have been avoided altogether or

Figure 8. Aberrant *moai*. Clockwise from top left: O'Tuu (photo: C. Richards); Okoro (note the deeply set eyes, which recall those of *moai* from Rano Raraku raised on to *ahu*); Ahu Hekii; Moai A Umu (photo: A. Stanford); Ahu Moai Tuu Paro; near Pui; Ahu Hoa Anga Vaka a Tua Poi.



relegated to the periphery of structures. Surely this is no coincidence. Red scoria's value, like that of many special things, lay within a prescribed set of practices and beliefs, in its case linked to *ahu*. On the evidence of its use in *ahu* crematoria and subsequently, and its absence from boat-shaped houses and other domestic structures, I suggest an association with death and funerary rites – to put it bluntly, it had something of the stink of death about it.

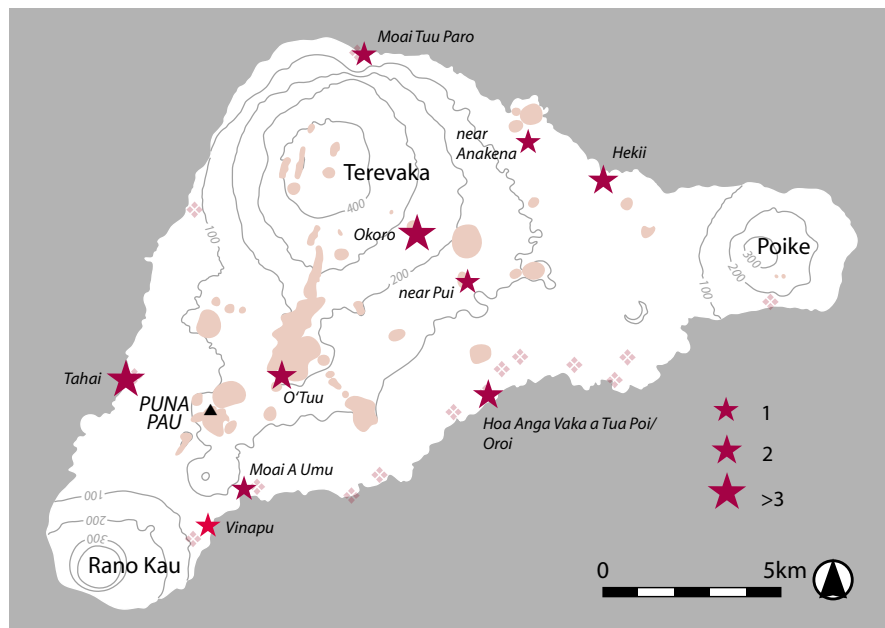
Aberrant moai

“Aberrant” here refers to *moai* that differ from the majority, because they were fashioned from a stone other

than Rano Raraku tuff, frequently red scoria, and/or because they were uncharacteristically stumpy in form. The term comes to us from the Heyerdahl team and encompasses the unique kneeling statue in Rano Raraku tuff that they unearthed at the main statue quarry, some other stumpy figures in the same material, a handful of flow lava statues from the north coast and Rano Kau (including the famous Hoa Hakananai’a or Hidden Friend, now in the British Museum), statues in trachyte from Poike, and at least 19 in red scoriae on or from 10 different sites around the Island (Figures 8 & 9; Table S4).

On stylistic grounds, aberrant *moai* have often been considered of different, often earlier date to *moai* in Rano

Figure 9. The distribution of aberrant *moai*. The stone comprising the statue from Vinapu is from Puna Pau; otherwise, once again, there is a direct correspondence between the use of red scoria and its natural distribution.



Raraku tuff, and interpreted accordingly. Thor Heyerdahl inferred “an early freedom in form and material” (Heyerdahl & Ferdon 1961: 510), for example, while Colin Richards (pers. comm.) is struck by the longer distance an aberrant *moai* in Puna Pau red scoria found at Vinapu’s *Ahu Tahira* was transported, when compared to the distribution of aberrant *moai* in other Island scoriae (Figure 9; Table S4), an observation that to him presages the topknot quarry’s later importance. (Topknots are widely believed to be a late addition to *moai* on *ahu* (e.g. McCoy 1976: 90).) Van Tilburg likewise considered the use of red scoria for statues to have been a question of choice but, rather than ending before the floruit of *moai* carving, to continue through it, with the foregoing Vinapu statue, again on stylistic grounds, falling late in the sequence. In Polynesia and the Pacific, she observed: “a significant number of . . . documented figures are carved of red scoria”, attributing it to the “association of the colour red (*kura*) with the idea of chiefly power and *mana*” (Van Tilburg 1986: 19–22). Few of these statues are or were meaningfully stratified, most being isolated finds, and there is little – if any – archaeological evidence to support any of these ideas. For *moai* in red scoria, however, Van Tilburg’s dating is probably closer to the mark than Heyerdahl’s – two small statues recorded by her in 1986 and presumably unknown to Heyerdahl resemble *moai* in Rano Raraku tuff from the main statue quarry and elsewhere (Van Tilburg 1986: figs 8 & 9) (Figure 8: top right); while her ethnographic analogy is certainly compelling. It is also indisputable that as a group, aberrant *moai* stand out from those in Rano Raraku tuff.

In fact, many of the themes of selection and avoidance explored above for topknots and building materials apply

equally to aberrant *moai*. Not one aberrant *moai* obviously stood on an *ahu*, although many share characteristics with those that did (notably sunken eye sockets). Nor were they demonstrably crowned with topknots. The *moai* fashioned from Puna Pau red scoria did travel far, like topknots; whereas those made from other scoriae, where they can be matched to a likely source (14 out of the remaining 18), did not (Table S4). At Vinapu, Puna Pau red scoria was chosen for one over locally available red scoria, while elsewhere other red scoriae were chosen over locally available flow lavas (Moai A Umu, for example, lies close to a quarry inland of *Ahu Hanga Hahave*, from which large flow lava blocks could have been obtained). Not all these features are exclusive to aberrant *moai* in red scoriae, but the recurrent association is nonetheless thought-provoking and once again we can infer a distinct meaning for the stone.

Finally, for two sites – Maunga Okoro, at the foot of which a cluster of between four and six *moai* appear to have been carved more or less *in situ* from the larger stones of a scree (Figure 8: top right), and Maunga O’Tu, where two more, still attached to the rock from which they were carved, lie in supine imitation of their famous cousins at Rano Raraku (Figure 8: top left) – there is an additional, possible interpretation. In many parts of the world we find the enhancement of sacred rocks and other natural features – Islam’s Kaaba, housing the famous black stone; the Inca *waka*, where living rock was carved into steps and encased in finely dressed masonry, and so on. Such concepts are known in Polynesia too, where we see both the association of hills and stones with particular deities (e.g. Henry 1928: 302) and, occasionally, the sacralisation of quarrying (in the Society Islands and

Figure 10. A precious resource through time? Clockwise from top left: a pockmarked topknot in front of *Ahu Te Pito Kura*; a topknot burial at *Ahu Vai Mata*; a frigate bird motif carved into a fallen topknot at *Ahu Akahanga*; modern gravestones of Puna Pau red scoria in Hanga Roa Catholic cemetery; the topknot from *Ahu Ko Te Riku* reused in the cemetery (beneath the cross) – Ko Te Riku is visible in the background; a partially scavenged topknot at Puna Pau; pseudo red scoria in Hanga Roa.



Marquesas and on Hawai'i – Kahn 2008; Linton 1923: 165; McCoy 1990), and they are hinted at locally by Puna Pau, and the evidence for ritual there, and Rano Raraku, which provides an unparalleled example of the sculptural enhancement of a natural feature. Possibly, therefore, we are seeing the same thing at Okoro and O'Tuu.

ROBBERY AND REUSE

Over the years, red scoria originally from Puna Pau has been systematically robbed from *ahu*, with topknots cut and gouged away and granules from these spilled like

blood over the *ahu* and around the heads of fallen *moai*. Puna Pau scoria from whole topknots (e.g. Vargas *et al.* 2006: 176–81) to formless lumps was incorporated into inhumation burials (Seelenfreund & Holdaway 2000) and fallen and abandoned topknots tagged with canoes, cup marks, eye masks, fish and frigate birds (Figure 10).⁴ Topknots were fashioned into basins (*taheta*) at *Ahu Vai Mata* (Figure 1: bottom left), Vinapu and One Makihi (by the modern road). In two boat-shaped houses, grotty kerbstones fashioned from Puna Pau red scoria were reused in their exterior pavements (Figure 5: bottom) and, occasionally, the stone even found its way into agricultural

mulches. Interest in Puna Pau red scoria continued well into the twentieth century. Of the 31 topknots mapped in and about the quarry by the Routledge team in 1914–15, for example, nine have since disappeared, and that belonging to *Ahu Ko Te Riku* (the one with the eyes, re-erected in the late 1960s) removed to the Catholic cemetery in Hanga Roa, where it now supports a cross (C. Cristino pers. comm.).⁵ Many modern headstones, too, are of red scoria, the earliest originally from Puna Pau, with only later ones coming from other Island sources. The Island even boasts fake Puna Pau red scoria (Figure 10) made by painting flow lava or spattered concrete red!

Evidence for the reuse of red scoriae from other sources is rare but its practice is confirmed by the presence in three *ahu* of whole or parts aberrant *moai* (Figure 8 (middle and bottom right); Table S3) – one of very few things aberrant *moai* share in common with *moai* in Rano Raraku tuff – and by the incorporation of a passage stone in local red scoria in the kerb of a boat-shaped house at *Ahu Oro*.

Insofar as the preponderance of reused Puna Pau red scoria came from *ahu*, it is impossible to know for sure what lay behind its choice: the stone itself or the *ahu* from which was derived. Nor should we lose sight of the fact that red scoria remained an intrinsically useful stone, a fact brought home to me by one elderly Rapanui's insistence that it was used for modern headstones because it is easy to work and resistant to weathering, not because of any lingering superstition surrounding it (N. Pakarati pers. comm.). Nonetheless, themes of selection and avoidance similar to those prevailing in prehistory do seem to have continued to apply through the period of robbing and tagging. This is most clearly evidenced by the reuse of Puna Pau red scoria in funerary contexts, a practice that was both frequent and widespread, and the contrast between this and its very infrequent use in other types of feature. Indeed, so unusual is the latter that where it does occur, it is tempting to interpret it as evidence for funerary-related activity. Finally, Puna Pau red scoria was a primary target for secondary tagging (Lee 1992: 126) and the tags themselves, both at *ahu* and Puna Pau, a limited range only of possible Island motifs (Table S5). This could be explained in a variety of ways, but it too could be an example of ritually motivated selection (ibid.).

SUMMARY

Through Easter Island's prehistory and early history, red scoria from different Island sources was used in quite different places for quite different things. That from Puna Pau was transported across the Island, where its utilisation was concentrated on *ahu*, and where it occurs in the form of topknots (*pukao*), as dressed building stone in their fronts, and in fragmentary form in their platforms and the associated crematoria. Later, it was also widely incorporated into inhumation burials, a tradition that possibly continues today. That quarrying at Puna Pau was ritually constrained is shown by the abandonment there of

still workable topknots and/or their arrangement in a Processional Way. By contrast, other Island red scoria, some of which shared the functional and visual properties of that from Puna Pau, travelled less far but had a wider range of uses, though these too were constrained, both at *ahu*, where they often occur in their rear walls but never as topknots, and in secular structures, such as boat-shaped houses (*hare paenga*), where they were widely relegated to a peripheral position. Analogous specialised use of stone from particular sources is closely paralleled on Hivaoa, in the Marquesas, where a quarry used for *tiki* and building stone used in sacred structures was governed by a strict *tapu*, and it is suggested that the use of Easter Island red scoria was controlled in a similar way.

CONCLUSION

Until first contact with the West and for some time after, Easter Island was a Stone Age society. Stone was used for tools, from picks to fishhooks; it was used in gardening; it was a medium of expression; and the Island's spiritual life, or aspects thereof, were mediated through it. The study of stone is therefore central to a full and proper understanding of it. This paper has taken just one of the many stone types used on the Island during this period, which owing to its often vivid colour and its use in conjunction with the Island's famous *moai* is familiar even to those not expert in the field. But it should not be assumed that the types of observation made of it apply uniquely to it: on the contrary, it was just one part of a much bigger set. It was special. But so too were Rano Raraku tuff, the use of which was likewise restricted, types of flow lava (in particular, a coarsely phenocrystalline variety from Maunga Terevaka and around Rua Toki Toki), which were transported for or as dressed stones over considerable distances, and various tool-stones, which had a wide and particular distribution. The lessons learned of it therefore have a wide application.

Practical observations made here about the Island's red scoria – about its nature, how it weathers, where it is to be found and how easy it is to be worked – can be applied directly to comparable prehistoric stone using cultures (the Marquesas, Pitcairn etc.), but what is most striking about it is its depth of meaning, and this of course cannot. Its study does, however, show us what is possible interpretatively and gives us an idea how we might realise this for other cultures, by using distributions across a landscape and a range of site types, studying avoidance, comparing the contexts of variants of the same type of stone and different types of stone, and attending generally to the patterning in and associations of stone in archaeology. Likely candidates for this kind of research include, in Polynesia, water-rolled stone, such as that used in the construction of Hawaiian *marae* (and, indeed, building stone everywhere) and the red scoria of the Marquesas, and in prehistoric Northern Europe, quartz, which also appears to have had something of the stink of death about it (e.g. Warren & Neighbour 2004: 89–91). It

remains to be seen whether the skills and imagination of other prehistoric stone using cultures match up to those of prehistoric Easter Island.

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NOTES

1. These are characteristics that are visible in both weathered and unweathered rocks. Most Easter Island rocks also incorporate isolated crystal inclusions or phenocrysts, which result from crystallisation within the magma comprising them prior to their eruption. These are difficult to see in weathered scoria, and since the artefactual stones examined were mostly weathered, of little help when trying to distinguish the facies comprising them.
2. My identification in Hamilton *et al.* (2011: pl. 3) of an unextracted topknot is wrong. Closer examination showed the scoria outcrop shown in this photograph to be far too poorly welded to have survived in this shape, in this location, since prehistory.
3. A typical Easter Island *ahu* – such as Nau Nau – comprises an approximately rectangular stone-built platform. To the front, there is a paved ramp, above which rise one or two courses of dressed masonry; to the rear, a more substantial vertical wall, comprising stone orthostats, coursed masonry or a combination of both. At Nau Nau and on other sites, the ramp extends beyond the central platform to form wings. On modified and “later” pyramid *ahu*, stones are ramped up from the front of the structure to the rear wall. Stone-built

crematoria survive to the rear and/or sides of many *ahu*. With the single possible exception of lost *Ahu Riki Riki*, coastal *ahu* and the *moai* mounted on them had their backs to the sea (Hamilton 2010).

4. Excavations by us around a topknot at Puna Pau showed the tags on it to postdate its burial by colluvial quarry spoil.
5. The topknot crowning the *moai* today is a facsimile fashioned from stone quarried at Puku Ga Aha Aha (L. Gonzales N. pers. comm).

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher’s website:

Table S1. Red scoria quarrying and possible quarrying on Easter Island.

Table S2. Red scoria in *ahu* (adapted from Martinsson-Wallin 1994 and Van Tilburg 1986, with additions). †, Not seen by MST.

Table S3. Red scoriae in boat-shaped houses.

Table S4. Red scoria “aberrant” *moai* (adapted from Van Tilburg 1986, with additions), †, Not seen by MST.

Table S5. Red scoria “aberrant” *moai* (adapted from Van Tilburg 1986, with additions).